

Attachment J-C14.1

Roads, Surfaced Areas, Signage and Fencing Work Instructions

<u>SOW Item No.</u>	<u>Title</u>	<u>Page</u>
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SOW Item No. C14-02
Building 154 Departure Sliding Gates PM

SECTION 7 - MAINTENANCE AND TROUBLESHOOTING

Inspection and service of this gate operator by a qualified technician should be performed anytime a malfunction is observed or suspected. High cycle usage may require more frequent service checks.

7.1 Maintenance

When servicing the gate operator, always check any secondary (external) reversing devices (loops, photocells, etc.) for proper operation. If external reversing devices cannot be made operable, do not place this operator in service until the malfunction can be identified and corrected.

Always check the inherent reversing system when performing any maintenance. If the inherent reversing system cannot be made operable, remove this operator from service until the cause of the malfunction is identified and corrected. Keeping this operator in service when the inherent reversing system is malfunctioning creates a hazard for persons which can result in serious injury or death should they become entrapped in the gate.

When servicing this gate operator, always turn power **OFF!!**

If gearbox requires oil, use only Mobil SHC-629 Synthetic Gear Oil. Do not completely fill gearbox with oil. Gearbox should be half full only. Do not exceed this level.

Operator Component	Maintenance	Monthly Interval		
		3	6	12
Alarm	Activate the primary (inherent) reverse system by blocking the gate with a solid object. When the gate reverses, block the gate in the opposite direction prior to the limit being reached. The entrapment alarm should activate. Press the reset button to silence the alarm.	✓		
Chain	Check for sagging. Tighten if necessary.		✓	
Fire Dept.	Check emergency vehicle access device for proper operation.	✓		
Gate	Inspect for damage. Check gate wheels, rollers and guides for wear and grease if necessary.		✓	
Grease	Wheels and guide rollers if necessary.		✓	
Loop(s)	Check vehicular exit and reverse loops for proper operation.	✓		
Primary Reverse System	Check that the gate reverses on contact with an object in both the opening and closing cycles. Adjust the reversing sensor if necessary.	✓		
Release	Check manual release for proper operation.	✓		
Secondary Reverse Device	Check secondary (external) reverse device(s) stop or reverse the gate when activated.	✓		
Sprockets	Check set screws for tightness.		✓	
Complete System	Complete check of gate and gate operating system.			✓

7.2 Built-In Diagnostic Tests

This gate operator is designed with built-in diagnostics that will alert you to potential or existing problems that the microprocessor has detected. Specific fault conditions are checked and the operator will signal that a fault exist through the built-in alarm.

Constant alarm is heard when power is applied: This indicates that the limit switch wire harness is not connected to the circuit board. In this condition, the operator will not run and the tone will continue until the fault is corrected. Check to be sure that the limit switch plug is properly inserted into the limit switch plug on the circuit board.

Constant alarm is heard: This indicates that the operator is in a hard shutdown condition (section 6.2 on page 34). The tone will continue to sound for five minutes, and then will beep once every five seconds. The operator-reset button must be pressed or power must be removed and then reapplied to return the operator to normal operation.

Short "chirp" is heard every five seconds: This indicates that the operator has been in a hard shutdown condition in excess of five minutes. This will continue until the operator-reset button is pressed or until power is removed from the operator (section 6.2 on page 34).

Operator runs for 1 second and stops, two short "chirps" are heard: This indicates that there may be a fault with the current sensor circuit.

7.3 Troubleshooting

Have a good VOM meter to check voltages and continuity. A Meg-Ohm meter capable of checking up to 500 meg-ohms of resistance is necessary to properly check the integrity of the ground loops. When a malfunction occurs, isolate the problem to one of three areas: **1. the operator, 2. the loop system, 3. the keying devices. Use caution when checking high voltage terminals, motor capacitor and the motor.**

1. Check the input indicator LEDs. They should only come ON when a keying device (card reader, push button, etc.) is activated. If any of the input LEDs are ON continuously, this will cause the gate operator to hold open. Disconnect the keying devices one at a time until the LED goes OFF.
2. Check any external secondary entrapment protection devices. Any short or malfunction in these devices can cause the gate operator to stop or to hold open.
3. A malfunction in a loop or loop detector can cause the gate operator to hold open, or to not detect a vehicle when it is present over the loop. Pull the loop detector circuit boards from the loop ports on the operator circuit board. If the malfunction persists, the problem is not with the loop system. For more information on trouble shooting loops and loop detectors, refer to your loop detector instruction sheet and to the DoorKing Loop and Loop Detector Information Manual located on DoorKing's web site.
4. Check to be sure that there are no shorted or open control wires from the keying devices to the gate operator. If a keying device fails to open the gate, press the Key Switch or momentarily jumper across terminals 1 and 4 on the operator circuit board. If the gate operator starts, this indicates that a problem exist with the keying device and is not with the gate operator.
5. If a three-button control station (open-close-stop) is connected to this gate operator, check for proper wiring. Only a DoorKing three button control station (P/N 1200-006 or 007) can be used with this gate operator. Others will cause a malfunction.
6. Check the high voltage supply. A voltage drop on the supply line (usually caused by using too small supply voltage wires) will cause the operator to malfunction. Refer to the wire size chart in section 2.1 on page 17.

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Symptom	Possible Solution(s)
Operator will not run. Power LED is OFF.	<ul style="list-style-type: none"> Check that AC power to the operator is turned ON. Transformer may be overheated. Turn power off and allow board to cool for several minutes then retest. Check for low VAC power and low voltage shorts. Check for VAC at high voltage input terminal. If voltage measures 0, check the incoming power wires or replace the circuit board.
Gate opens a short distance, then stops and reverses.	<ul style="list-style-type: none"> Disconnect the gate from the gate operator and check that the gate slides freely without any binding. Re-adjust the reverse sensitivity. Continue troubleshooting or replace circuit board.
Gate opens but will not close.	<ul style="list-style-type: none"> Check the input LEDs. Any ON will hold the gate open and indicates a problem with a keying device. Check the secondary safety devices. Any activated will hold the gate open and indicates a problem with the safety device. Check the loop detectors. Any activated can hold the gate open and indicates a problem with the loop detector or ground loop. Operator may be in a "soft shutdown." Activate any keying device to determine if operator returns to normal operation. If automatic close is desired, be sure SW 1, switch 2 is ON and set timer open from 1-23 seconds. Bypass circuit board and check motor as above.
Gate closes but will not open.	<ul style="list-style-type: none"> Operator may be in a "soft shutdown." Check input LEDs. If any are ON, momentarily disconnect, then re-connect the wire going to the respective terminal. Operator should open. Check to be sure that the operator is running in the proper direction. Turn power OFF, and then back ON. Activate a keying device. Operator should run in the open direction. If operator runs in the close direction, turn power OFF and change direction switch SW 1, switch 1. Go to above section if operator now opens but will not close. Be sure that the each LED on the control board lights when the keying device connected to the that terminal is activated. If LED does not light, momentarily place a jumper wire from terminal 1 to the input terminal being checked. If LED lights and gate opens, problem is with the keying device. If LED does not light, replace control board. Bypass circuit board and check motor as described above.
Gate starts to close, then reverses to open.	<ul style="list-style-type: none"> Re-adjust the reverse sensitivity. Disconnect the gate from the gate operator and check that the gate slides freely without any binding. Check the loop detector LEDs and input LEDs. Any that flash ON will cause the gate to reverse. Continue troubleshooting or replace circuit board.
Gate closes then re-opens.	<ul style="list-style-type: none"> Check for any input or loop detector LED's that are ON. Check that the operator is running in the proper direction (see "gate closes but will not open").
Alarm is sounding. Operator will not run.	<ul style="list-style-type: none"> Operator is in a "hard shutdown" condition. Reset button must be pushed to return operator to normal operation, see Section 6.2 Shutdown Conditions, page 34. Check the gate and gate hardware for any binding, correct where necessary. Gate may be too heavy.
Alarm chirps once every 5 seconds. Operator will not run.	<ul style="list-style-type: none"> Operator has been in a "hard shutdown" condition in excess of 5 minutes. Reset button must be pushed to return operator to normal operation, see Section 6.2 Shutdown Conditions, page 34.
Alarm sounds when power is applied and operator will not run.	<ul style="list-style-type: none"> The limit switch wire harness is not plugged into the circuit board. Check that the limit switch connector is properly plugged into the limit switch plug on the circuit board.
Operator runs for 1 second and stops, two short chirps are heard.	<ul style="list-style-type: none"> There may be a problem with the current sensor on the circuit board. Replace the circuit board.

7.4 Accessory Items

The following accessory items are available for the series 9200 slide gate operators.

Contact Sensors - For use as a secondary entrapment protection device. Miller Edge, Inc., MGO20, MGR20, MGS20

Chain Tray Kit - 10 Ft. section. Sections connect together to fit any length gate. P/N 2601-270

Pedestal Mounting Stand - Heavy-duty pedestal mounting stand for the 9200 series operator. P/N 9200-135

Heater and Fan Kit - Recommended for cold weather climates.
P/N 1601-195: 115 VAC models, P/N 1601-197: 208/230 VAC models

Photo Cell - Non-contact (photocell) sensors for use as a secondary entrapment protection device.
MMTC, Inc. Model IR55 - P/N 8080-010 MMTC, Inc. Model 60-278 - P/N 8080-011
Carlo Gavazzi Type PMP12 - P/N 8080-030 Carlo Gavazzi Type PMT - P/N 8080-031

Loop Detector - Detectors plug directly into ports on circuit board simplifying wiring.
Single channel detector - P/N 9410-010 Dual channel detector - P/N 9409-010

Loop Wire - 18 AWG loop wire with XLPE insulation is ideal for ground loops. Available in 500 and 1000 foot rolls. Red, blue or black insulation.

Pre-Fab Loops - Prefabricated ground loops. 24-foot circumference with 50-foot lead-in. Available in yellow, red or blue jackets. Not for use in asphalt roadways.

Loop Test Meter - Meg-ohm meter checks the integrity of ground loops. P/N 9401-045

3-Button Control Station - Provides open-close-stop manual operation of the gate.
Stand Alone Box - P/N 1200-006 Interior (fits in single gang box) - P/N 1200-007

Interconnection Cable - Interconnect wire cable contains all the necessary wires to interconnect primary / secondary operators.
Cable length: 30 ft. - P/N 2600-755 40 ft. - P/N 2600-756 50 ft. - P/N 2600-757

Time Clock - 7 day and 365 day time clocks can be used to automatically open gate at pre-set time and days. Compact clock fits inside the operator. 7 day clock - P/N 2600-791 365 day clock - P/N 2600-795

V-Wheels - 4 inch and 6 inch. UHMW or Steel. Roller bearings or sleeve bearings. Single or tandem wheel configurations.

Surge Devices - High and low voltage surge suppressors help prevent circuit board failure caused by lightning strikes and power surges. High Voltage - P/N 1876-010 Low Voltage - P/N 1878-010

Gate Scale - Use to test torque required to move gate. P/N 2600-225

Remote Alarm/Reset Station - Provides a remote station to reset an operator in a hard shutdown condition. Must be mounted in line-of-site of the gate and operator. Includes visual alarm light and audible siren. P/N 1404-080.

Speed Bumps - Prefabricated six-foot speed bump reduces traffic speed through gate system. P/N 1610-150

Installation/Owner's Manual

Series 9200

Heavy-Duty Vehicular Slide Gate Operator

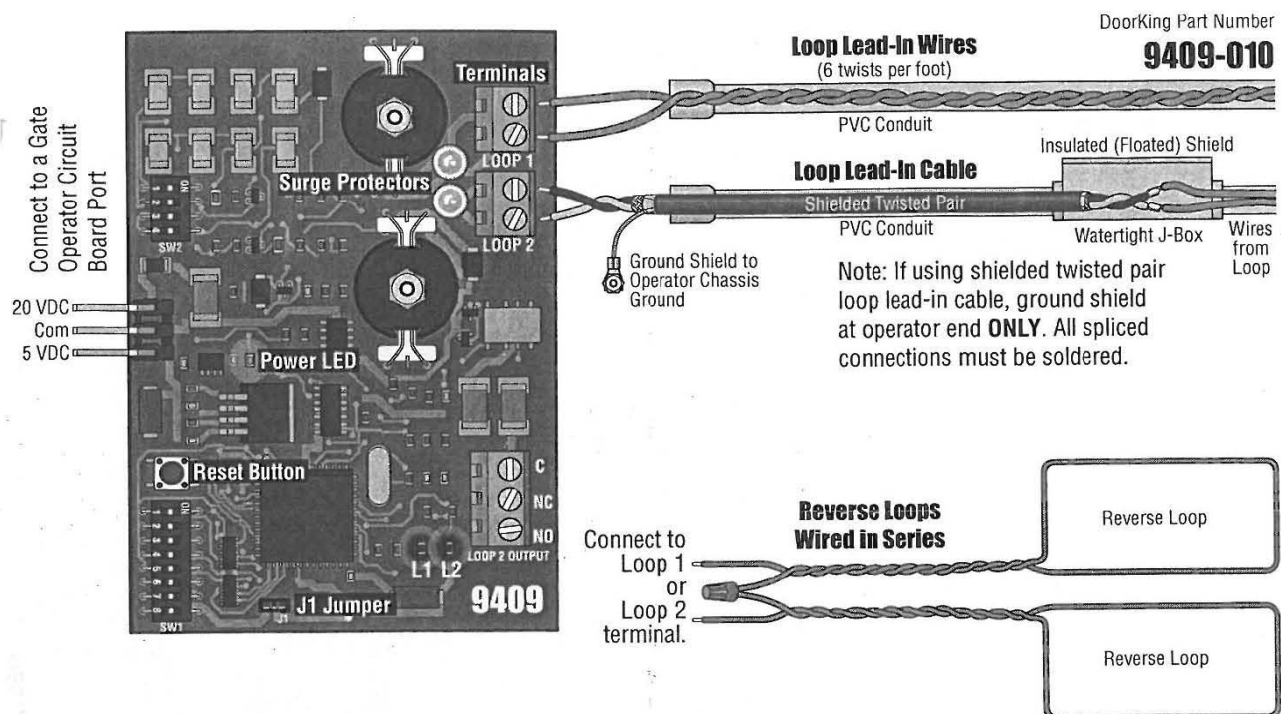
Use this manual for circuit board 4404-010 Revision A or higher.

9210-065-B-9-11



www.doorking.com

DoorKing, Inc.
120 Glasgow Avenue
Inglewood, California 90301
U.S.A.
Phone: 310-645-0023
Fax: 310-641-1586



Loop 1 Terminal

Connect the loop lead-in wires or cable to terminal. Ground loop lead-in cable to operator chassis ground if used.

Loop 2 Terminal

Connect the loop lead-in wires or cable to terminal. Ground loop lead-in cable to operator chassis ground if used.

Loop 2 Output

The output of loop 2 can activate a form C dry contact relay. Connect Common (C), Normally Closed (NC) or Normally Open (NO) to the gate operator circuit board as required.

J1 Jumper for Loop 2

J1 jumper is set for Loop 2 to operate in the Presence mode (Normal Operation). Removing this jumper will cause Loop 2 to operate in the Pulse mode (Relay activates for 250 ms, then drops out. Used for specific applications only.).

Loop 1 always operates in the Presence mode (Normal Operation).

Reset Button

Pressing the reset button clears faults and resets the detector.

Power LED

Illuminates when detector has acceptable power.

L1 LED

Illuminates when loop detector senses a vehicle in Loop 1's detection field and will also indicate Loop 1's frequency when the detector is powered up or when a physical problem exists in the loop itself.

L2 LED

Illuminates when loop detector senses a vehicle in Loop 2's detection field and will also indicate Loop 2's frequency when the detector is powered up or when a physical problem exists in the loop itself.

Loop Monitoring with L1 and L2 LEDs

The loop detector constantly monitors the frequency of the loop to determine if the frequency is too high or too low, or if the loop system has a physical problem. When this happens, the detector will "Lock On" and the L1 or L2 LED will steadily flash depending on which loop has the problem. If the frequency of the loop returns to nominal levels, the detector will resume normal operation but will continue to flash the corresponding LED. A steadily flashing L1 or L2 LED is an indication that a physical problem exist in the loop system itself and that the loop will probably have to be replaced. The L1 or L2 LED can be reset by pressing the reset button.

9405-065-G-4-09

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DKS
DOOR KING, INC.
120 Glasgow Avenue
Inglewood, California 90301 U.S.A.

Dual-Channel Loop Detector

DoorKing Part Number

9409-010

This "Self-tuning" loop detector is designed to be used with DoorKing vehicular gate operators **ONLY** and control two individual loops (including 2 series wired reversing loops configuration). The loop detector plugs into loop detector ports on the gate operator control board. This "Self-tuning" detector will constantly monitor the loop's frequency status and "Self-tune" for any minor deviations with the frequencies to keep the loop operating normally and decrease "false calls". The detector also employs several automatic and advanced features that will assist technicians in the field with trouble shooting loop problems.

Refer to the **Loop Information Manual** located at www.dkaccess.com for information on installing in-ground loops.

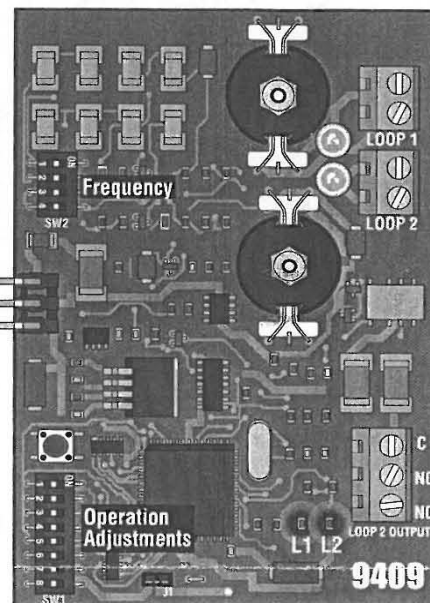
Frequency DIP-Switches

When the detector is powered up, or when the reset button is pressed, the detector will blink out the frequency each loop has tuned to (in KHz), first on L1 and then L2 LEDs. For example, L1 blinks five times - pause - blinks six times then L2 blinks five times - pause - blinks two times indicates that Loop 1 has tuned to 56 KHz and Loop 2 has tuned to 52 KHz. This automatic frequency measurement is useful in applications for two or more loops that are in close proximity to each other.

DIP SW 2	LOOP 1		LOOP 2	
	Switch 1	Switch 2	Switch 3	Switch 4
High	OFF	OFF	OFF	OFF
Med-High	OFF	ON	OFF	ON
Med-Low	ON	OFF	ON	OFF
Low	ON	ON	ON	ON

A common problem with loops are when they are positioned too close to each other and their detection fields overlap. If the loops are on similar frequencies, this can cause "cross-talk" between

the loops and "false calls" can occur in the loop detector(s). Knowing what frequency each loop has tuned to allows you to adjust the frequencies of each loop. Keep the frequencies as far apart from each other as possible and the loop with the longest length of wire should be set to the lowest frequency. Switching the frequency of a loop **WILL NOT** affect any of the operation adjustments or the over all detecting height of the loop.



Operation Adjustments DIP-Switches

DIP SW 1	Adjust Loop Sensitivity				Turn On Sensitivity Boost		Turn On Fast-Trak	
	LOOP 1		LOOP 2		LOOP 1	LOOP 2	LOOP 1	LOOP 2
	Switch 2	Switch 3	Switch 6	Switch 7	Switch 4	Switch 8	Switch 1	Switch 5
Low	OFF	OFF	OFF	OFF	Normal-OFF Boost-ON	Normal-OFF Boost-ON	Normal-OFF Fast-Trak-ON	Normal-OFF Fast-Trak-ON
Med-Low	OFF	ON	OFF	ON				
Med-High	ON	OFF	ON	OFF				
High	ON	ON	ON	ON				

Loop Sensitivity

Adjusts how much moving metal must be present in the loop detection field before the loop detector will send an output.

Sensitivity Boost

Once the detector senses a vehicle, this feature increases the loop detector's sensitivity to compensate for a higher section of that vehicle (usually a truck trailer or truck bed) that the detector may not completely sense, and allow the vehicle to pass completely over the loop before closing the gate. This prevents the loop detector from "losing detection" on a higher part of a vehicle and start the closing cycle before the vehicle has cleared the loop. This feature can be individually turned **ON** for each loop but **WILL NOT** increase a loop's over all detecting height.

Fast-Trak

Fast-Trak is useful on degraded loops that may drift in frequency over a period of time. An indication of this would be when the detector has an excessive amount of "false calls". This is usually caused by poor quality wire in the loop itself, a poor wire connection in the loop system or wire insulation damage. It usually fails when the loop gets wet but will work OK when the moisture is gone. When Fast-Trak is turned ON, it will allow the loop's frequency to drift more than normal and not give the excessive "false calls". **Caution** should be exercised when using the Fast-Trak feature. If excessive frequency drift continues (indicated by an excessive amount of "false calls" with Fast-Trak turned ON), the loop itself will have to be replaced. Fast-Trak can be individually turned **ON** for each loop.

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DOOR KING, INC.
120 Glasgow Avenue
Inglewood, California 90301 U.S.A.

SOW Item No. C14-03
Building 154 Final Denial Barriers PM

Weekly Testing

Perform weekly testing of the barrier. It is paramount that the Emergency Fast Operate (EFO) and the Up/Down circuits are tested for the following reasons:

- A. Circulate the hydraulic fluid
- B. Assure Barrier is prepared to function
- C. Hydrate barriers hydraulic seals.
- D. Test operational controls.

Every other Month (Bi-Monthly)

- __1. Block off lanes of traffic where barrier maintenance is to be performed.
- __2. Bleed pressure off barrier system until the motor turns on. Observe pressure gauge at the time the motor starts, and stops.
- __3. Log this value on the hydraulic pressure log.
- __4. Place the barrier in the raised position. Install safety legs.
- __5. Shut down barrier power; bleed all hydraulic pressure from the system.
- __6. Inspect all hoses and fittings for leaks (Tighten fittings where leaks are recognized)
- __7. Inspect the hoses ensuring no hoses are resting on the ground
- __8. Remove all top plates; hinge cover plate and access box cover plate. Inspect and clean cavities (Where applicable)
- __9. Inspect and clean debris within the barrier foundation
- __10. Inspect for leaks around the cylinders and barrier header fittings (Tighten fittings where necessary)
- __11. Tighten any loose fittings
- __12. Inspect for tightness of barrier block bolts
- __13. Verify the operation of barrier heaters (where applicable)
- __14. Verify the barrier heaters were set between 60-75 degrees (where applicable)
- __15. Verify the level of the hydraulic fluid in the sight glass (if supplied)
- __16. Add clean filtered oil as necessary after verification of the fluid level in the sight glass.
- __17. Inspect the HPU for cleanliness and debris and remove any dust, debris and clean up any spilled oil
- __18. Inspect all Barrier Skirt (Front and Side) bolts for tightness.
- __19. Inspect the barrier cavity for proper drainage and drain blockage. Clean if necessary.
- __20. Restore barrier to operational status
- __21. Function Test Barrier Operation

Yearly Maintenance

- __1. Block off lanes of traffic where barrier maintenance is to be performed.
- __2. Bleed pressure off barrier system until the motor turns on. Observe pressure gauge at the time the motor starts, and stops.
- __3. Log this value on the hydraulic pressure log
- __4. Place the barrier in the raised position. Install safety legs.
- __5. Shut down barrier power; bleed all hydraulic pressure from the system.
- __6. Drain oil reservoir.
- __7. _____ and replace the oil filter.
- __8. _____ reservoir with clean filtered Bio-degradable hydraulic oil to OEM recommended levels on the sight glass fluid indicator.
- __9. Inspect the hydraulic ram cylinders for internal and external leaks

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- __10. Inspect the cylinder clevis pins for wear and replace as necessary
- __11. Inspect the barrier top plate, frame, and barrier cavity for pain condition and/or corrosion
- __12. Correct identified paint/corrosion discrepancies through preparation of the surface, priming and touch up painting
- __13. Inspect all hoses for leaks, wear, kinks and/or bulging
- __14. Check the accumulator pressure by applying power to the motor verifying the hydraulic pressure gauge needle position.
- __15. Log this value of the hydraulic pressure
- __16. Inspect all fitting and tighten fittings where leaks are recognized
- __17. Inspect the hoses ensuring no hoses are resting on the ground
- __18. Remove all top plates (hinge cover plate and access box cover plat)
- __19. Inspect and clean debris within the barrier foundation
- __20. Inspect for leaks around the cylinders and barrier header fittings
- __21. Tighten any loose fittings
- __22. Inspect for tightness of barrier block bolts
- __23. Reinstall the barrier hinge cover plate verify tightness of all bolts (insert with blue locktite)
- __24. Verify the operation of barrier heaters (where applicable)
- __25. Verify the barrier heaters are set between 60-75 degrees
- __26. Reinstall the access box cover plate verify tightness of all bolts (insert with blue locktite)
- __27. Inspect all Barrier Skirt (Front & Side) bolts for tightness. (if Required)
- __28. Inspect the barrier cavity for proper drainage and drain blockage
- __29. Inspect the HPU for cleanliness, corrosion; and debris; and remove any dust, debris, clean up any spilled oil, prep and painted rusted areas
- __30. Restore Barrier to Operational Status
- __31. Function Test Barrier Operation

The maintenance contractor shall complete the maintenance log sheets for bi-monthly and yearly maintenance cycles. The contractor shall also include all inspection items listed the maintenance sheets.

Attachment B

Maintenance Log

Test Procedures

Maintenance Log (one report per HPU location)

Date: _____ Time: _____

Location: _____

Installation technician: _____ Printed _____

Installation technician: _____ Signature _____

Barrier Inspection

Barrier in the closed position

General neatness of barriers

Barrier top plate condition (paint, rust)

Barrier frame recessed screws

Poor Fair Good Excellent Remarks

☐ ☐ ☐ ☐

☐ ☐ ☐ ☐

☐ ☐ ☐ ☐

Barrier in the open position

Face and side (paint, bolts)

Barrier cavity (standing water)

☐ ☐ ☐ ☐

☐ ☐ ☐ ☐

Yes No

Barrier Inspection (Cont)

Inside HPU	Poor	Fair	Good	Excellent	Remarks
Control board enclosure (wiring neatness)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Backup battery installation	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	
Hydraulic hose (bundled neatly)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	
Hydraulic hose (Raised off ground)	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	
Electrical breaker annotated in legend	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	

Digital pictures taken during maintenance inspection (per barrier frame / HPU)

Barrier	1	2	3	Remarks
Barriers in closed position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Barriers in open position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Barrier access cavity box	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Barrier skirting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Barrier Hinge pin plate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Barrier Hydraulic Ram (cotter pin)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HPU overall view (open)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
HPU pressure and fluid site glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

HPU conduit stub outs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HPU control panel box	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Light stanchions (closed)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Light stanchions (open)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Barrier functionality test Barrier 1

Were you able to conduct barrier test	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Remarks
---------------------------------------	------------------------------	-----------------------------	---------

Safety Loop Calibration

During functionality testing did the safety loops operate properly Yes ☐ No ☐

Current settings on Loop detection sensor

Front loop Frequency High ☐ Med ☐ Low ☐

Back loop Frequency High ☐ Med ☐ Low ☐

New settings (If Needed)

Front loop Frequency High ☐ Med ☐ Low ☐

Back loop frequency High ☐ Med ☐ Low ☐

Current Sensitivity Settings

Front loop 1-9 _____

Back loop 1-9 _____

New Sensitivity Setting

Front loop 1-9 _____

Back loop 1-9 _____

Re-test system with new calibrations ☐

Wrong Way Loop Calibration

During functionality testing did the wrong way loops operate properly

Yes ☐ No ☐

Current settings on Loop detection sensor 1

Front loop Frequency High ☐ Med ☐ Low ☐
Back loop Frequency High ☐ Med ☐ Low ☐

Current Sensitivity Settings

Front loop 1-9 _____
Back loop 1-9 _____

Current settings on Loop detection sensor 2

Front loop Frequency High ☐ Med ☐ Low ☐
Back loop Frequency High ☐ Med ☐ Low ☐

Current Sensitivity Settings

Front loop 1-9 _____
Back loop 1-9 _____

Current settings on Loop detection sensor 3

Front loop Frequency High ☐ Med ☐ Low ☐
Back loop Frequency High ☐ Med ☐ Low ☐

Current Sensitivity Settings

Front loop 1-9 _____
Back loop 1-9 _____

Over Speed functionality test B

Were you able to conduct over speed test

Yes ☐ No ☐ Remarks _____

Additional corrective actions not listed

Please note any and all additional corrective actions that were accomplished at this HPU (i.e. cleaned up excess wire, tied back existing wire in control box, wiped out control box, and hydraulic oil residue)

Additional corrective actions required that could not be performed during this visit

Please note any and all additional corrective actions required that could not be performed during this visit (i.e. Paint of entire top plate, barrier drain clogged, barrier hydraulic lines damaged)

SOW Item No. C14-04

Building 4 Tarmac Access Control PM

24 \ F: OPERATOR MAINTENANCE GATE OPENER OPERATION & SAFETY GUIDE



It is recommended that the following maintenance be performed on the operator at a minimum (for high use installations (>100 cycles per day), steps noted below as monthly should be performed every 2 weeks):

- ✓ Monthly - Check the function of all safety devices (inherent sensing, photo-eyes and safety edges).

1. Photo Eye Inspection

- Break the beam of the photo eye in the direction of gate travel. The gate should either stop then reverse for 2 seconds then stop of if programmed for second option reverse to full open or closed position.
- Clean the lenses on both photo eyes.
- Check mounting on both photo eyes - they should not move or vibrate.
- Check the alignment of photo eyes by shaking both photo eyes lightly. The photo beam should not break.

2. If the operator has reversing edges, they should be hooked to the reversing circuit - not the entrapment circuit.

- To test the edges compress the edge at the furthest point from the cable lead in.
- The gate should stop then reverse to the full reverse position. This should be tested on both directions of gate travel if so equipped. Check the mount of the reversing edge to verify the edge is not slipping down.
- Batteries should be replaced twice a year. Record the date of replacement on the battery or cover.
- On the receiver for the edge, inspect the antenna mount (it must be isolated from grounding).

3. Check other traffic control devices for proper operation (loop detectors, traffic lighting, warning devices, etc.).

- ✓ Monthly - Check the drive chain tension (maintain 1" to 2" sag maximum between chain support brackets). Tighten as necessary.

- ✓ Monthly - Check the operation of the gate; it should operate smoothly and quietly back and forth. It should not bang into the receiver catcher and should not pinch the reversing edges. If so make the necessary adjustment (see Gate Installation Manual).

- ✓ Monthly - Check the clutch for slippage and gearbox for oil level;

1. Check the clutch for proper adjustment - as the gate travels close, place medium force against gate travel. If the gate pushed you away loosen the clutch, if the gate stops with little force tighten the clutch. See operator Installation and Owner's Manual for adjustment of proper force.

2. Check the gear box for oil leaks (visual check only).

- ✓ Monthly - Inspect the electro-mechanical lock for operation and alignment. Adjust as necessary.

- ✓ Monthly - Follow gate Installation and Maintenance Manual for gate related tuning and adjustments (at a minimum check truck wheels and guide rollers for proper adjustment and wear, replacing if necessary).

- ✓ Quarterly - Check for proper manual operation.

- ✓ Quarterly - Check sprockets, limit switches and chain alignment:

1. Clean and lubricate the drive chain with a high grade chain and lube spray (do not lubricate the trucks or track area). Inspect the drive sprocket and idler sprockets.

2. Sprockets should be in a straight line and should not be allowing the chain to rub on the motor cabinet. Check the screws on flange bearings and sprocket for tightness.

3. Inspect the drive chain. It should not be real tight or real loose. There should be about 1/4 inch travel in chain.

- ✓ Yearly - Check all wiring for integrity of insulation.


- ✓ Yearly - Check the tightness of all electrical connections.

- ✓ Yearly - Remove any foreign matter from the interior of unit.

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5.

MAINTENANCE

 Do not attempt maintenance or repairs to the vehicle gate unless you are trained and qualified. Improper operation or maintenance of the gate can cause equipment damage and severe injury.

5.1 Introduction

Shield® model vehicle gates are designed to be largely maintenance free. However, as with any complex electromechanical device, they must be periodically inspected and serviced to ensure they are operating correctly. Maintenance levels will depend on both gate usage and site conditions. The gate is designed for a continuous duty cycle. Harsh conditions at the site—such as extreme temperatures, blowing sand, and salt air—will mean more frequent service. Initially, follow the maintenance guidelines below. But you may want to adjust these recommendations based on your usage, site conditions, and experience.

5.2 Personnel Safety & Gate Lockout

Whenever you work on or around the gate, you must follow both common sense safety rules and the procedures described below and throughout this manual. The gate and its control systems can cause injury or death from electrical shock or from the movement of the heavy components. Anyone working on the gate must be trained, qualified, and familiar with both the gate's hazards and its safety features. Always put safety first, and stop work and seek guidance if you are unsure about the safety of any activity in and around the gate.

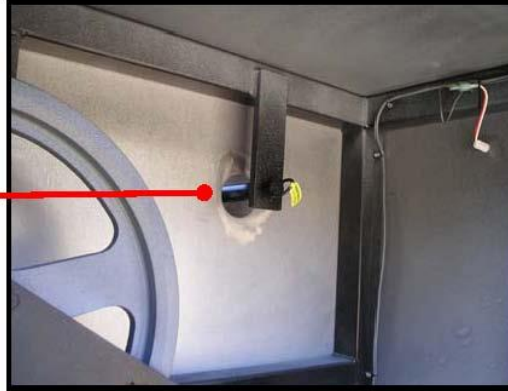
When you work on the gate or its controls you should generally do the following. However, depending upon the work being performed, certain electrical circuits or hydraulic components may have to remain energized.

- Decide if the work you will perform should be done with the gate down (road closed) or gate up (road open), and put the gate in either the full down or full up position. Most maintenance is done with the gate down.
- Turn the power switch on the control panel to OFF.
- Turn the Master Power Switch inside the operator enclosure to OFF.
- Disengage the battery backup system by moving the DC power switch to OFF.
- As appropriate, de-energize and lockout any other electrical circuits serving the gate and its systems.
- Install the T/M Safety Pin. See Section 5.3 below.

5.3 Installing and Removing the T/M Safety Pin

5.3.1 The T/M (for transportation/maintenance) Safety Pin must be installed so that the gate is locked whenever maintenance is performed, unless it is specifically stated that the pin must be removed to perform the required task. The T/M safety Pin must be removed and stored before returning the gate to service.

T/M Safety Pin Installed



T/M Safety Pin stored



! • The control system is designed to withstand any attempted gate operation while the T/M Safety Pin is installed. However, it is good practice to not attempt to operate the gate while it is locked.

5.4 Routine Maintenance

AutoGate, Inc. recommends the following maintenance and inspection cycles. Increase the frequency if your gate has a high duty cycle or operates under harsh conditions.

5.4.1 Routine Inspection (perform daily or as needed based on your site conditions)

- With the gate down, walk around the gate and look for and remove windblown paper, plastic, or other debris from around the operator enclosure, yokes, and bolsters. ! Do this inspection from a distance. Do not place your head, torso, or limbs in these areas.

- Remove snow and ice accumulations from the beam/gate and other components. Heavy snow and ice accumulations can alter the beam/gate balance and impact gate operation.

5.4.2 Weekly Inspection and Service (most of these require the gate to be energized)

- Clean the lenses on the photoelectric transmitter and receiver as required.
- Clear vehicles and pedestrians away from the gate. Raise and lower the gate and observe its motion. Verify the motion is smooth and the up and down times are within the normal range.
- Clear vehicles and pedestrians away from the gate. Confirm the photoelectric sensor is working by blocking the sensor while the gate is operating and verifying that the gate reverses direction and returns to its full open or closed position.

5.4.3 Every Six Months (or 10,000 cycles) Inspection and Service

Note: Lubrication locations are shown on the 24V Gate Operator Details

- Install the T/M Safety Pin.
- Grease the pivot pins on the linkage assembly using Lubriplate Low Temperature grease.
- Grease the two bearings on the operator arm and the two bearings on each of the two bullwheel shafts.
- Grease the chain tension bolt (two places) and lubricate the chain.
- Check belts for wear and tightness. Belt flex should be 1/2" (using hand pressure) on the top and bottom between the bullwheel and output sheaves.
- Check battery water level and fill as required with distilled water.

This is not required on sealed, maintenance-free batteries.

- Unlock the gate before resuming gate operation.

5.4.4 Gate Balancing: Perform Four Months after Initial Operation, then Annually Thereafter

Note: This balancing procedure must be performed if the *Shield®*'s balance springs are ever replaced.

- 5.4.4.1. Remove the wire nut on the red motor lead and attach an amp meter between the red wire and the orange wire.
- 5.4.4.2. Cycle the gate up and down and record the highest amp reading in both directions. The high readings should be in the range of 2–6 amps and should be almost identical (1 amp or less difference). If they are not, the slide assembly requires adjustment. (See the *Shield®* – Balancing Slide Assembly drawing in Section 7.)
- 5.4.4.3. To adjust the slide assembly, loosen the 1-1/8" adjustment nuts on either side of the Spring Adjustment Mechanism on the threaded rod. If the amps are high when the gate is opening, move the slide assembly up to help the gate open (this is the most common adjustment). If the gate is opening easily but closing with difficulty, move the slide assembly down. Only adjust the slide assembly about 1/4" (3–4 turns) at a time. After each adjustment, check the amp readings.
- 5.4.4.4. Continue this process until the amp readings are nearly identical (within 0.5 amps) and within the range of 2-6 amps. The gate will now be in balance. Tighten both adjustment nuts on the slide assembly's threaded rod. Operate the gate to verify it moves easily in both directions.

5.5 If the Gate is Damaged by Vehicle Impact

If a vehicle strikes the gate, even accidentally and at low speed, some component damage is likely. If this occurs, contact AutoGate, Inc.. We will help you assess the consequences and make sure there is no hidden damage that will compromise safety or the gate's effectiveness. In addition, we will help you determine which components should be replaced. We can also provide pricing on those replacement components, and offer advice to repair the damage.

Actual crash testing has shown that the *Shield®*'s in-ground foundation can withstand a design basis vehicle impact (15,000-pound truck traveling at 30 mph) without structural damage. The above-ground gate can be replaced and no excavation is required. Contact AutoGate, Inc. for

instructions on how to remove the damaged gate, how to install a replacement, and how to test your repaired system to ensure it is operating correctly.